harman/kardon

SUB-TS7 (HKTS 7 SUBWOOFER)

SUB-TS8 (HKTS 8 SUBWOOFER)

SERVICE MANUAL

harman/kardon, Inc.
250 Crossways Park Dr.
Woodbury, New York 11797

Rev0 10/2004

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SPECIFICATIONS

Amplifier Power (RMS)	100 Watts
Driver	10" woofer, Bass Reflex Enclosure
Inputs	Stereo Line Level, dedicated Subwoofer (LFE) and Speaker Level with gold-plated binding posts
Outputs	Speaker Level with gold-plated binding posts
Frequency Response	35Hz – 120Hz (Filter switch ON) 35Hz – 450Hz (Filter switch OFF)
Dimensions (H x W x D)	18-7/8" x 13-3/8" x 13-3/8" 479mm x 340mm x 340mm
Weight	33 lb/15kg

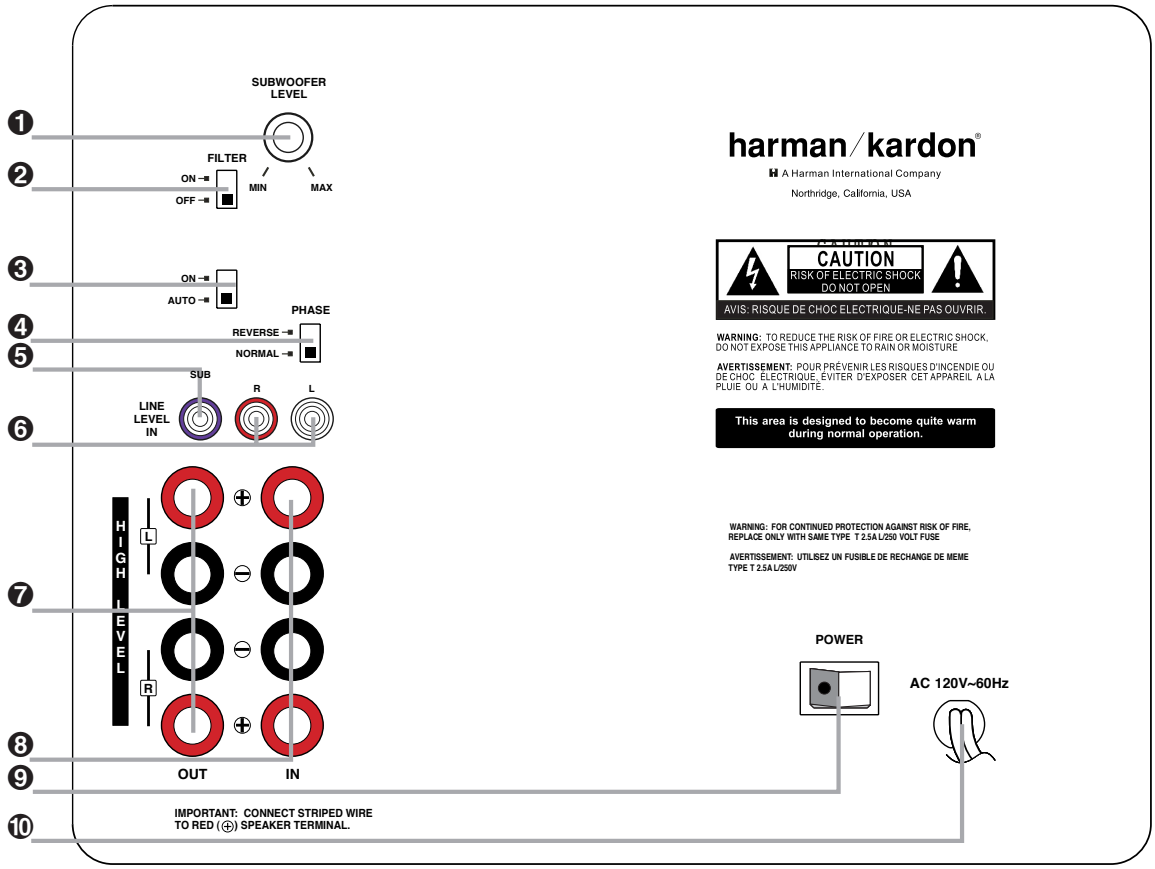
Occasional refinements may be made to existing products without notice but will always meet or exceed original specifications unless otherwise stated.

SUB-TS7 100W Powered Sub/ Plate Amp
SUB-TS8 100W Powered Sub/ Plate Amp

LINE VOLTAGE	Yes/No	Hi/Lo Line	Nom.	Unit	Notes
US 120vac/60Hz	Yes	108-132	120	Vrms	Normal Operation
Parameter	**Nonimal Specification**	**Unit**	**QA Test Limits**	**Conditions**	**Notes**
Amp Section					
Type (Class AB, D, other)	AB	n/a	n/a		
Load Impedance (speaker)	4	Ohms	n/a	Nominal	
Rated Output Power	100	Watts	75	50 - 250 Hz, 1 input driven, limiter off	
THD @ Rated Power	0.08	%	0.1	22k filter	
THD @ 1 Watt	0.15	%	0.5	22k filter	
DC Offset	5	mV-DC	30	@ Speaker Outputs	
Damping factor	>100	n/a	30	Measured at amplifier board	Measured at the speaker at speaker output terminals on the amp board.
Input Sensitivity					
Input Frequency	50	Hz	n/a	Nominal Freq.	
Line (L&R) Input	220	mVrms	154 - 308	To Rated Power	Single input driven
SUB (LFE) Input	125	mVrms	87 - 175	To Rated Power	SUB (LFE) input driven only
Speaker/Hi Level Input	2.2	Vrms	1.5 - 3.0	To Rated Power	(20 dB below Line In), Single input driven
Hi Level Max. Input Voltage	32	Vrms	30	Nominal Freq., Min. Volume	
Signal to Noise					
SNR-A-Weighted	100	dB	85	relative to rated power	A-Weighting filter
SNR-unweighted	90	dB	80	relative to rated power	22k filter
SNR rel. 1W-unweighted	65	dB	60	relative to 1W Output	22k filter
Residual Noise Floor	1.2	mVrms	3.0	Volume @max, using RMS reading DMM/VOM (or A/P)	
Residual Noise Floor	0.8	mVrms	2.0	Volume @max, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics)	
Input Impedance					
Line Input (L, R,LFE)	10K	ohms	n/a	Nominal	
Speaker/Hi Level Input	4.7K	ohms	n/a	Nominal	
Filters					
L&R Fixed Low-Pass Filter	170	Hz	150 - 200	@ -6dB ref. 100Hz	2nd order fixed
SUB (LFE) Low pass Filter	270	Hz	240 - 300	@ -3dB ref. 100Hz	2nd order fixed
Subsonic filter (HPF) 3rd Order	28	Hz	22 - 28	@ -3dB ref. 30Hz	3rd order fixed
Limiter					
THD at Max. Output Power	2.0	%	5.0		
Features					
Auto - On -Off Selection Switch	YES		functional		Refer to ATO section
Phase Switch	0-180	deg	functional		
Filter On/Off Switch	YES		functional		
Volume Pot Taper (Lin/Log)	LOG		functional		A Taper
Speaker Out	YES		functional		Binding post connector L&R
2-Color LED power indicator	YES		functional		Blue: On, Amber: Stand-by
Power Switch	YES		functional		
Fuse Holder	YES		functional		
Input Configuration					
Line In (L,R)	YES		functional		Dual RCA jack
SUB (LFE)	YES		functional		RCA jack
Speaker/Hi Level In	YES		functional		Binding post connector L&R
Signal Sensing (ATO)					
Auto-Turn-On (yes/no)	YES		functional	Auto - on selection switch in Auto	
ATO Input test frequency	50	Hz	n/a	Auto - on selection switch in Auto	
ATO Level Line & SUB Input	4.0	mV	2.0 - 6.0	Auto - on selection switch in Auto	
ATO Level Speaker in	40	mV	25 - 55	Auto - on selection switch in Auto	
ATO Turn-on time	5	ms	functional	Amp connected and AC on, then input signal applied	
ATO Turn-OFF Time	15	minutes	10 - 20	Time before muting, after signal is removed	
Power on Delay time	3	sec.	functional	AC Power Applied	
Transients/Pops					
ATO Transient	5	mV-peak	10	@ Speaker Outputs	
Turn-on Transient	50	mV-peak	100	@ Speaker Outputs	AC Line cycled from OFF to ON

Parameter	Nonimal Specification	Unit	QA Test Limits	Conditions	Notes
Turn-off Transient	50	mV-peak	100	@ Speaker Outputs	AC Line cycled from ON to OFF
Efficiency					
Stand-by Input Power	10	Watts	12	@ nom. line voltage	Maximum allowable input power under nominal input voltage and frequency, in stand-by mode (HOT or COLD operation).
Power Consumption @ rated pow	170	Watts	200	@ nom. line voltage	100 Watts @ 4.0 ohms and nominal line voltage
Protection					
Short Circuit Protection	YES		functional	Direct short at output	Amplifier should resume operation after short circuit condition is removed.
Thermal Protection	YES		functional		Any user accessible metal parts should always remain at 65 degree C or less for domestic version or 55 degree C or less for EU version.
DC Offset Protection	YES		functional	DC present at Speaker Out leads	Relay or crowbar (for driver/fire protection),
Primary Fuse Rating					
USA-Domestic (120V)	2.5	Amps	n/a	Type-T or Slo Blo	User-replacable fuse with UL/SEMCO rated holder.

SUBWOOFER AMPLIFIER PANEL CONTROLS AND CONNECTIONS


SUBWOOFER LEVEL
FILTER
ON
OFF
MIN
MAX
ON
AUTO
PHASE
REVERSE
NORMAL
SUB
R
L
LINE LEVEL IN
HIGH LEVEL
L
R
OUT
IN
IMPORTANT: CONNECT STRIPED WIRE TO RED (⊕) SPEAKER TERMINAL.
harman/kardon
A Harman International Company
Northridge, California, USA
CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN
AVIS: RISQUE DE CHOC ELECTRIQUE-NE PAS OUVRIR.
WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE
AVERTISSEMENT: POUR PRÉVENIR LES RISQUES D'INCENDIE OU DE CHOC ELECTRIQUE, ÉVITER D'EXPOSER CET APPAREIL A LA PLUIE OU A L'HUMIDITÉ.
This area is designed to become quite warm during normal operation.
WARNING: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE T 2.5A L/250 VOLT FUSE
AVERTISSEMENT: UTILISEZ UN FUSIBLE DE RECHANGE DE MEME TYPE T 2.5A L/250V
POWER
AC 120V~60Hz

❶ Subwoofer-Level Control
❷ High-Cut (Low-Pass) Filter Switch
❸ Music-Sense On/Off Switch
❹ Phase Switch
❺ Line-Level Subwoofer (SUB) Input
❻ Line-Level Full-Range Inputs
❼ Speaker-Level Outputs
❽ Speaker-Level Inputs
❾ Master Power Switch
❿ AC Power Cord

❶ Subwoofer-Level Control: Volume may be adjusted using the **Subwoofer-Level Control**. Turn the control clockwise to increase the **Subwfr** volume, or counterclockwise to decrease it.

❷ High-Cut (Low-Pass) Filter Switch: Placing switch in the **◊N** position activates circuitry that cuts out all audio input signals above 120Hz. This allows the **Subwfr** to focus its power on reproducing the low-frequency portion of the signal, avoiding inefficiency and distortion. Engage this filter when using the **Speaker-Level Inputs ❽**, or when using the **Line-Level Full-Range Inputs ❻**, unless your receiver or processor processes its line-level output using a low-pass filter. The filter has no effect when the **SUB Input ❺** is used.

❸ Music-Sense On/Off Switch: When placed in the **AUT◊** position, and when the **Master Power Switch ❾** is turned on, the **Subwfr** will automatically turn itself on or place itself in the Standby mode, depending on whether it is receiving an audio signal. When this switch is placed in the **◊N** position, the **Subwfr** will remain on, whether or not it is receiving an audio signal.

An LED located on top of the **Subwfr** indicates whether the **Subwfr** is in the ON or STANDBY state when used with the **Music-Sense On/Off Switch ❸** in the **AUT◊** position. The LED is lit blue to indicate that the **Subwfr** is receiving an audio signal

SUBWOOFER AMPLIFIER PANEL CONTROLS AND CONNECTIONS

and is turned on, and the LED is lit amber to indicate that no signal is being received and the Subwfr is in Standby mode.

When the **Music-Sense On/Off Switch ❸** is in the ON position, the LED will be lit blue, whether or not an audio signal is present.

When the **Master Power Switch ❾** is turned off, the LED goes dark, no matter which position the **Music-Sense On/Off Switch ❸** is in.

❹ Phase Switch: This switch determines whether the subwoofer's piston-like action moves in and out in phase with the main speakers. If the speakers were to play out of phase, the sound waves produced by the subwoofer would be cancelled out, reducing bass response. This phenomenon depends in part on the relative placement of the speakers in the room. In most cases, the **Phase Switch ❹** should be left in the NORMAL position. However, it does no harm to experiment with the **Phase Switch ❹**, and you may leave it in the position that maximizes bass response.

❺ Line-Level Subwoofer (SUB) Input: Connect the subwoofer output of a receiver with digital surround sound decoding, such as Dolby* Digital or DTS®, to this input. This input bypasses the Subwfr's internal crossover circuitry, and should only be used with a filtered signal. If your receiver does not have digital decoding, you should use the **Line-Level Full-Range Inputs ❻** instead.

❻ Line-Level Full-Range Inputs: Connect the line-level subwoofer output or preamp output(s) of your receiver or amplifier to these inputs. If your receiver does not have a separate subwoofer output, use a Y-adapter (not supplied) to bridge the receiver's preamp output to the main amp input for that channel, and connect the long end of the adapter to the corresponding line-level input on the Subwfr. If your receiver has only a single subwoofer output, you may connect it to either the left or right line-level input on the Subwfr, and no Y-adapter is needed.

❼ Speaker-Level Outputs: If you are using the **Speaker-Level Inputs ❽** on the Subwfr, you should connect these binding-post terminals to the front left and right speakers, remembering to maintain polarity by connecting the (+) terminal on the subwoofer to the (+) terminal on the speaker, and the (–) terminal on the subwoofer to the (–) terminal on the speaker. If you are not using the **Speaker-Level Inputs ❽**, then connect your front left and right speakers directly to your receiver or amplifier. See pages 8 for further information on speaker connections.

❽ Speaker-Level Inputs: Connect these binding-post terminals to the main left and right speaker terminals of your receiver or amplifier, if your receiver or amplifier does not have a line-level subwoofer output. Remember to maintain polarity by connecting the (+) terminal on the receiver/amplifier to the (+) terminal on the subwoofer, and the (–) terminal on the receiver/amplifier to the (–) terminal on the subwoofer.

❾ Master Power Switch: Place this switch in the "•" position to power-on the subwoofer. The Subwfr will then be either in the Standby mode or completely on, depending on the position of the **Music-Sense On/Off Switch ❸**.

❿ AC Power Cord: Make sure to plug this cord into an active, unswitched electrical outlet for proper operation of the Subwfr. The cord should not be plugged into the accessory outlets found on some audio components.

SPEAKER CONNECTIONS

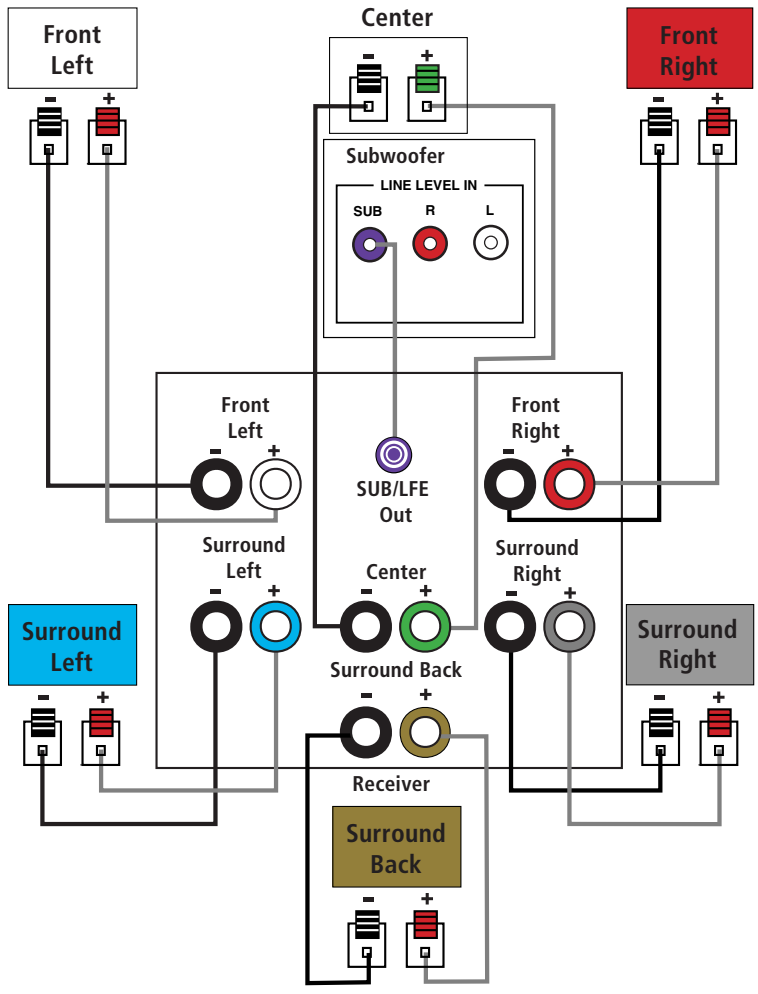
Dolby* Digital or DTS® (or Other Digital Surround Mode) Connection

USE THIS INSTALLATION METHOD FOR DOLBY DIGITAL, DTS OR OTHER DIGITAL SURROUND PROCESSORS:

Use the line-level input jack marked **SUB** ❺ for the Low-Frequency Effects channel. Connect this jack to the subwoofer output or LFE output on your receiver or amplifier. Connect each speaker to the corresponding speaker terminals on your receiver or amplifier.

Make sure you've configured your surround sound processor for "Subwoofer On." The front left, front right, center and surround speakers should all be set to "Small."

When all connections have been made, plug the AC power cord on the subwoofer into an AC outlet.



SPEAKER CONNECTIONS

Dolby Pro Logic* (Non-Digital) – Line Level

USE THIS INSTALLATION METHOD FOR DOLBY PRO LOGIC APPLICATIONS (NOT DOLBY DIGITAL, DTS OR OTHER DIGITAL PROCESSING), WHERE THE RECEIVER/PROCESSOR IS EQUIPPED WITH A SUB-WOOFER OUTPUT, OR A VOLUME-CONTROLLED PREAMP (LINE-) LEVEL OUTPUT:

Use the supplied RCA-type interconnect cable to connect the line-level subwoofer output on your receiver or amplifier to either the left or right **Line-Level Full-Range Input ❻** on the subwoofer. Use both the left and right inputs on the sub-woofer if your receiver or processor has both left and right line-level outputs. In that case, you will need to supply a second interconnect cable.

If your receiver is equipped with line-level out-puts but does not have a separate subwoofer output, use a Y-adapter (not supplied) to bridge the receiver's preamp output to the main amp input for that channel, and connect the long end of the adapter to the corre-sponding line-level input on the **Subwfr**.

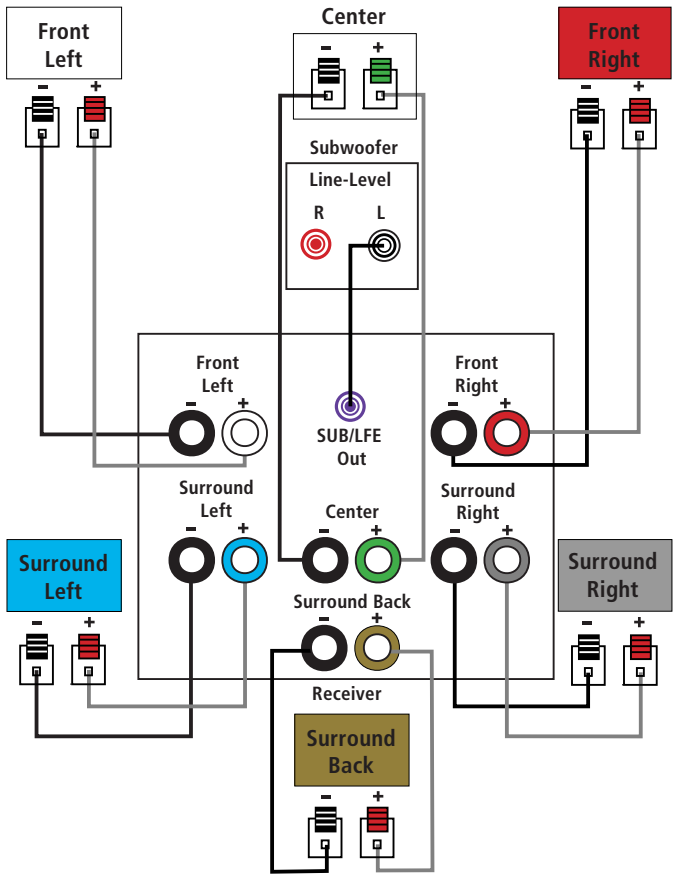
IMPORTANT: Do not use the **SUB Input ❺** on the subwoofer with Dolby Pro Logic processors.

If your receiver/processor has a built-in low-pass-crossover filter for the subwoofer out-put, you may use the **SUB Input ❺** to bypass the subwoofer's internal crossover.

Connect each speaker to the corresponding speaker terminals on your receiver or amplifier.

Make sure that you have configured your surround sound processor for "Subwoofer On." The front left, front right, center and surround speakers should all be set to "Small."

When all connections have been made, plug the AC power cord on the subwoofer into an AC outlet.



SPEAKER CONNECTIONS

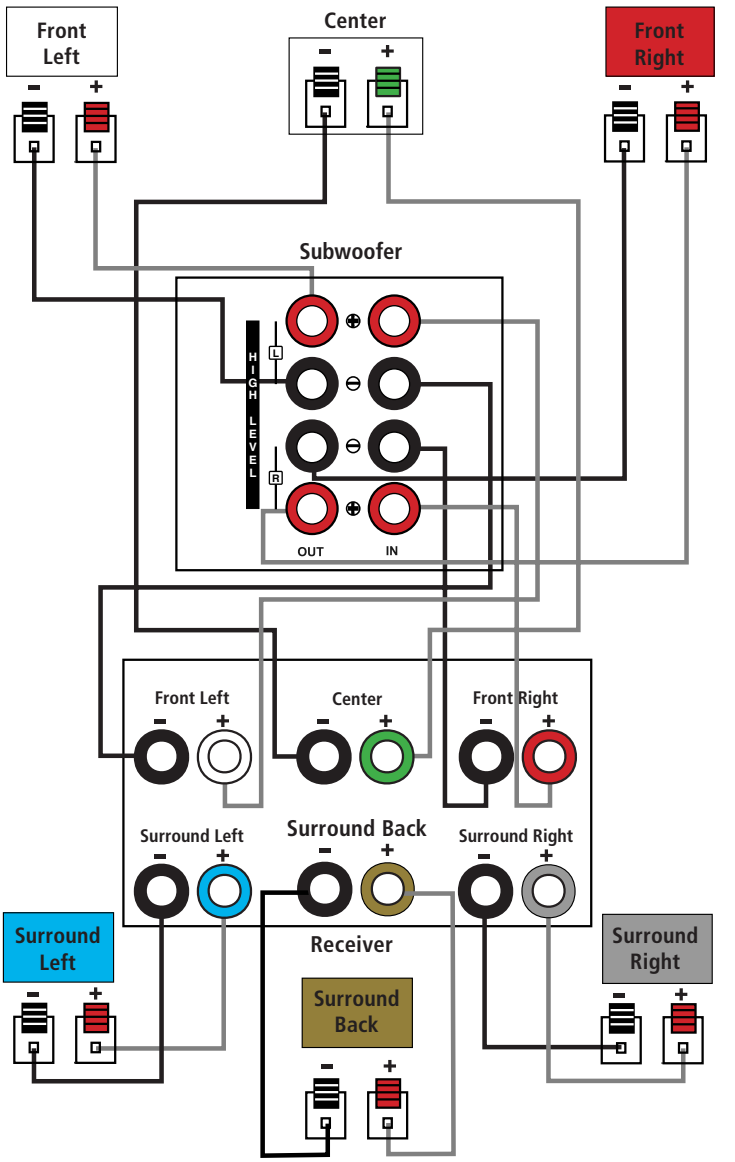
Dolby Pro Logic (Non-Digital) – Speaker Level

USE THIS INSTALLATION METHOD FOR DOLBY PRO LOGIC APPLICATIONS (NOT DOLBY DIGITAL, DTS OR OTHER DIGITAL PROCESSING), WHERE THE RECEIVER/PROCESSOR DOES NOT HAVE A SUB-WOOFER OUTPUT, OR A VOLUME-CONTROLLED PREAMP (LINE-) LEVEL OUTPUT:

Connect your receiver or amplifier's front left and right speaker terminals to the left and right **Speaker-Level Input** ❽ terminals on the **Subwfr** subwoofer that are marked "High Level In." Connect the left and right **Speaker-Level Output** ❼ terminals on the **Subwfr** subwoofer that are marked "High Level Out" to the corresponding terminals on the back of your front left and right speakers.

Connect your receiver or amplifier's center and surround speaker terminals to the corresponding terminals on the back of your center and surround speakers.

When all connections have been made, plug the AC power cord on the subwoofer into an AC outlet.



OPERATION

Move the **Master Power Switch** ❾ (marked **Power**) to the "•" (On) position. The **Subwfr** subwoofer will automatically turn itself on or go into Standby mode, depending on whether or not a signal is being sent to it by your receiver or surround processor, and provided that the **Music-Sense On/Off Switch** ❸ is moved down so that it is in the AUTO position.

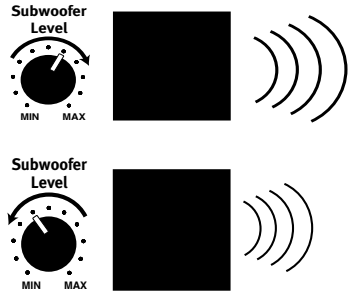
When your receiver or amplifier is off, or is not sending program material to the subwoofer, the subwoofer will be in Standby mode and the LED Indicator on the top of the subwoofer will turn amber. When the subwoofer senses an audio signal, it will automatically turn itself on and the LED Indicator will turn blue. If the subwoofer does not sense a signal after approximately twenty minutes, it will automatically go into Standby mode.

When the **Music-Sense On/Off Switch** ❸ is switched to the ON position, the subwoofer will remain on, whether or not program material is playing, and the LED Indicator will remain lit blue.

If you'll be away from home for an extended period of time, or if the subwoofer will not be used, switch the **Master Power Switch** ❾ to the OFF position.

Volume

Volume can be adjusted using the **Subwoofer-Level Control** ❶, as shown. Turn the control knob clockwise to increase the volume of the subwoofer, and counterclockwise to decrease the subwoofer's volume.



Additional Bass Adjustments

In addition to the volume adjustments described above, the **Subwfr** subwoofer includes a **Phase Switch** ❹ and a **Filter Switch** ❷ that can be used to adjust the bass response to suit your listening environment or taste.

In most situations, the **Phase Switch** ❹ should be left in the NORMAL position. If you suspect that the subwoofer is playing out of phase with the other speakers, which would tend to diminish bass response, try placing this switch in the REVERSE position. There is no harm in experimenting, and you may return the switch to the NORMAL position at any time. If you rearrange your room and reposition the speakers, it would be a good idea to check whether they are in phase by flipping this switch.

The **High-Cut (Low-Pass) Filter Switch** ❷ limits the frequencies of the audio signal inputted to the subwoofer to the low frequencies that the subwoofer reproduces best. This allows the subwoofer to perform more efficiently, and with superior bass reproduction, minimizing distortion that might occur if the subwoofer attempted to reproduce higher frequencies. This switch should be left in the ON position, **except**:

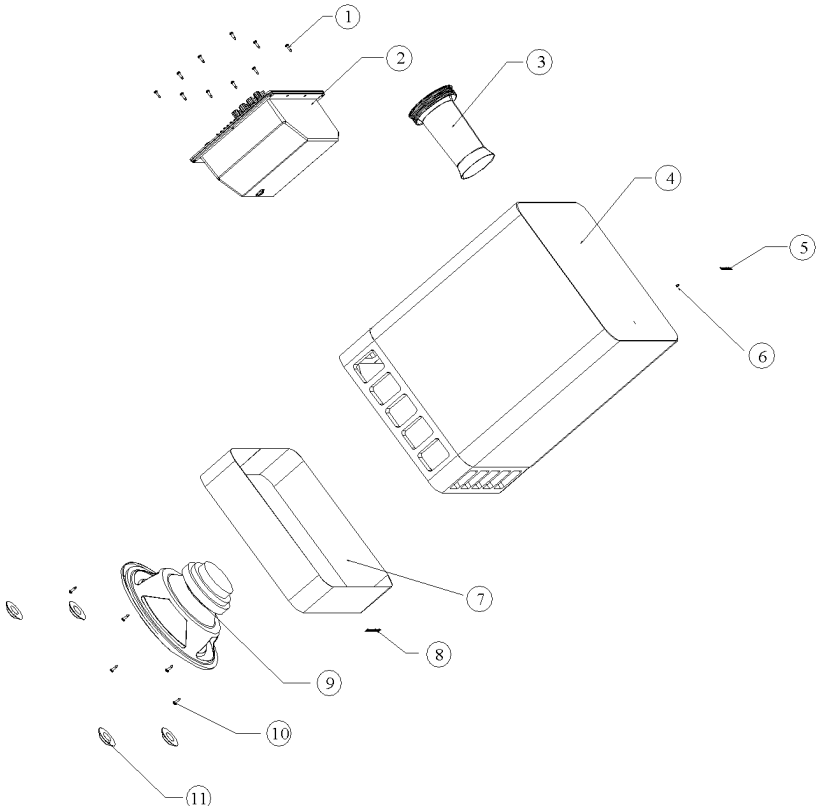
1. When the **SUB Input** ❺ is being used, in which case it has no effect, or

2. When the **Speaker-Level Inputs** ❽ or the **Line-Level Full-Range Inputs** ❻ are being used with a crossover or filter aboard the receiver or processor.

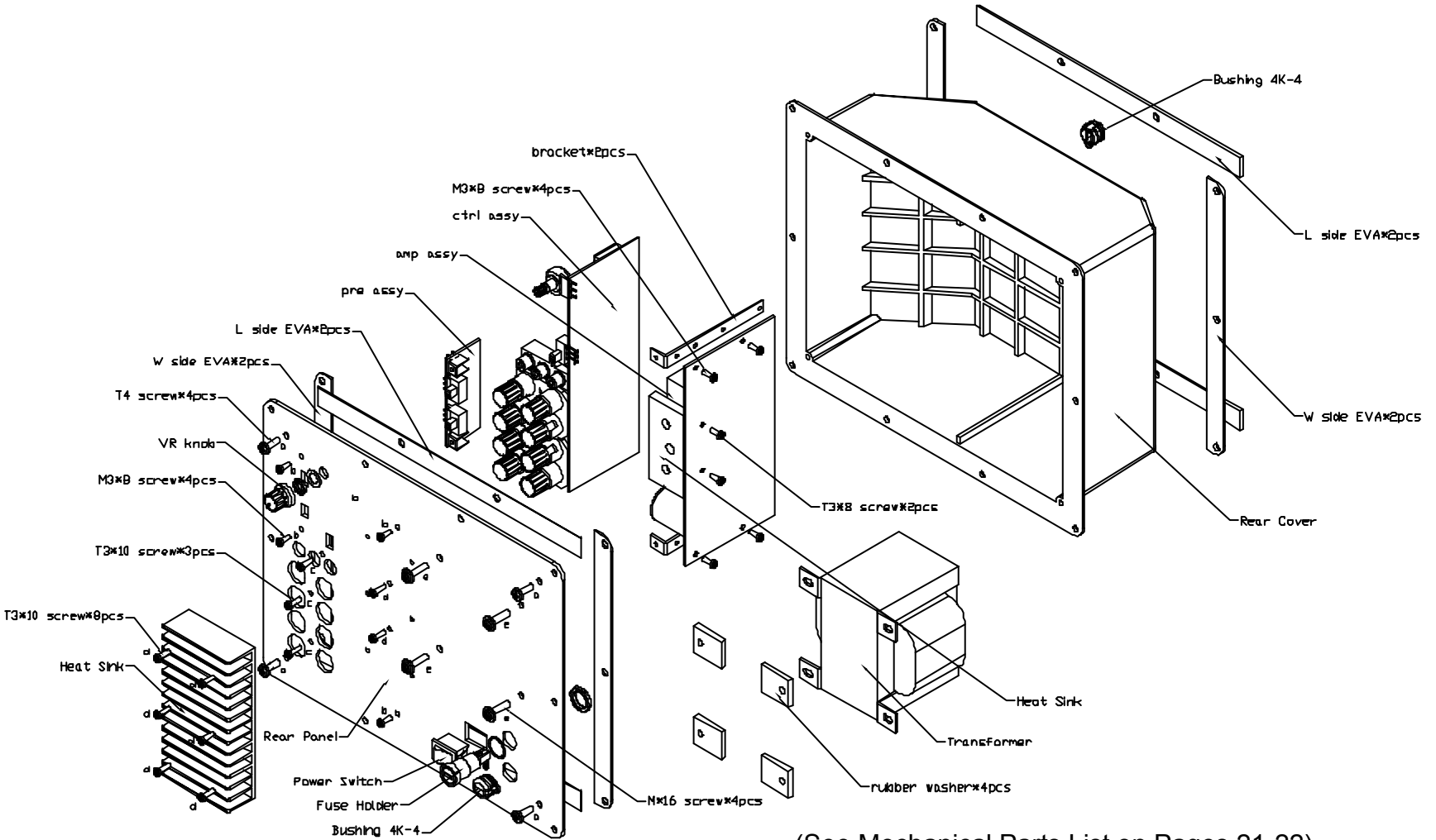
In these two circumstances, place the switch in the OFF position.

TROUBLESHOOTING

SYMPTOM	SOLUTION
If there is no sound from any of the speakers:	• Check that receiver/amplifier is on and a source is playing. • Check that the powered subwoofer is plugged in and its **Master Power Switch ❾** is switched on to the "•" position. • Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut, punctured, or touching other wires. • Review proper operation of your receiver/amplifier.
If there is no sound coming from one speaker:	• Check the "Balance" control on your receiver/amplifier. • Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured, and that no wires are touching each other. • In Dolby Digital or DTS mode, make sure that the receiver/processor is configured so that the speaker in question is enabled. • Turn off all electronics and switch the speaker in question with one of the other speakers that is working correctly. Turn everything back on, and determine whether the problem is in the same place: i.e., the speaker that was working previously now has no sound and the speaker that was not working now sounds fine; or whether it has moved: i.e., the speaker that was not working still has no sound and the speaker that was working is still fine. If the problem is in the same place, the source of the problem is most likely with your receiver or amplifier, and you should consult the owner's manual for that product for further information. If the problem has followed the speaker, consult your dealer for further assistance or, if that is not possible, visit our Web site at www.harmankardon.com for further information.
If there is no sound from the center speaker:	• Check all wires and connections between receiver/amplifier and speaker. Make sure all wires are connected. Make sure none of the speaker wires are frayed, ccut, punctured, or touching other wires. • If your receiver/processor is set in Dolby Pro Logic mode, make sure the center speaker is not in phantom mode. • If your receiver/processor is set in Dolby Digital or DTS mode, make sure the receiver/processor is configured so that the center speaker is enabled.
If the system plays at low volumes but shuts off as volume is increased:	• Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut, punctured, or touching other wires. • If more than one pair of main speakers is being used, check the minimum impedance requirements of your receiver/amplifier.
If there is low (or no) bass output:	• Make sure the **SUB ❶** or **Line-Level Inputs ❻** of the subwoofer and SUB or LFE output of your receiver or amplifier are properly connected by the RCA-type interconnect cable. • If you are using the **Subwfr**'s **Speaker-Level Inputs ❽**, check your speaker cables to make sure they are all connected; that none of the wires are frayed, cut, punctured, or touching other wires; and that you have maintained the correct polarity by connecting positive terminals to positive terminals, and negative terminals to negative terminals. • Make sure the subwoofer is plugged into an active electrical outlet and its **Master Power Switch ❾** is switched on to the "•" position. • Check the speaker setup (bass management) settings in your A/V receiver or processor to make certain that the front, center and surround speakers are configured for "Small," and that the subwoofer is set for "Yes" or "On."
If there is no sound from the surround speakers:	• Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut, punctured, or touching other wires. • Review proper operation of your receiver/processor and its surround sound features. • Make sure the movie or TV show you are watching is recorded in a surround sound mode. If it is not, check to see whether your receiver/processor has other surround modes you may use. • In Dolby Digital or DTS mode, make sure your receiver/processor is configured so that the surround speakers are enabled. • Review the operation of your DVD player and the jacket of your DVD to make sure that the DVD features the desired Dolby Digital or DTS mode, and that you have properly selected that mode using both the DVD player's menu and the DVD disc's menu.

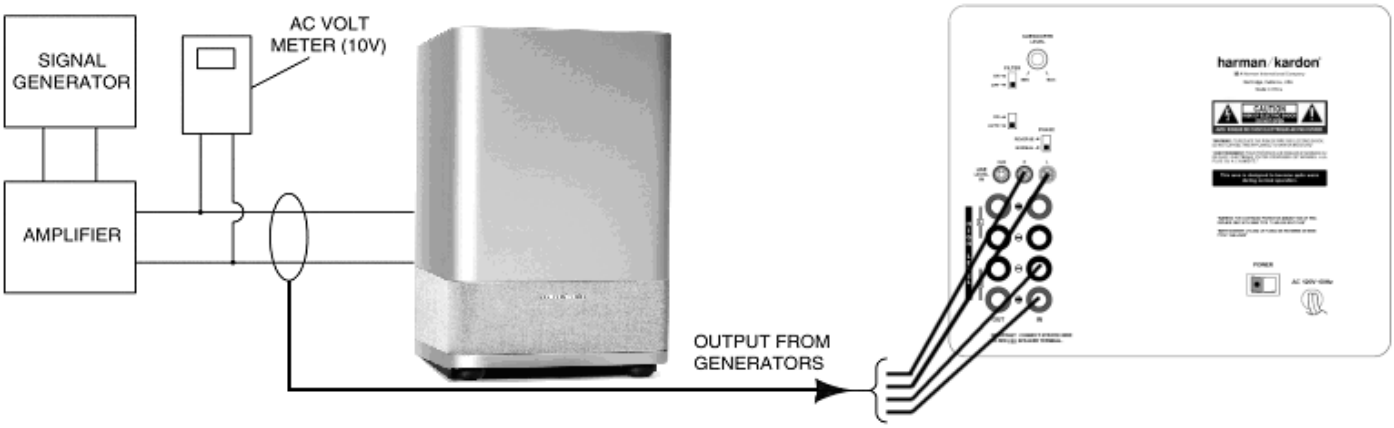


Ref#	Description	Part Number	Qty
1	Amplifier screw	352-AM04020D210	10
2	SUB-TS7/TS8 Amplifier	Not for Sale	1
3	Port Tube	Not for Sale	1
4	SUB-TS7/TS8 Cabinet	Not for Sale	1
5	Logo	316-AG-00557	1
6	LED	Not for Sale	1
7	Grille	Not for Sale	1
8	Logo	316-AL-00553	1
9	10" woofer	25PF12DZB-DW01	1
10	Woofer screw	352-FM04020D605	5
11	Foot Pad	320-EVA-00057	4



(See Mechanical Parts List on Pages 21-22)

Test Set Up and Procedure



Equipment needed:

- Function/signal generator/sweep generator
- Integrated Amplifier
- Multimeter
- Speaker cables

Initial Control Settings:

- Power Switch OFF; Filter OFF
- Level MIN (Full CCW)
- Phase, Auto/On switches do not matter

General Unit Function (UUT = Unit Under Test)

1) From the signal generator, connect one line level (RCA) cable to the Subwoofer Line Level Input jacks L/R on the UUT. Use a Y-cable from a mono source if necessary to connect to both inputs. Do not connect to the single, purple SUB input.
2) Turn on generator; adjust to **75mV, 50 Hz**.
3) Plug in UUT; turn the power switch ON. Turn LEVEL control full clockwise (MAX)
4) LED should turn from Amber to Blue (on top of UUT); immediate and vigorous bass response should be heard and felt from port tube opening.
5) Turn off generator, turn LEVEL control full counterclockwise (MIN), and disconnect RCA cable.
6) Connect one pair of speaker cables to Speaker Level input terminal (IN) on UUT. Cables should be connected to an integrated amplifier fed by the signal generator.
7) Turn on generator and adjust so that speaker level input at the amplifier is **1.6V, 50 Hz**. Turn LEVEL control full clockwise.
8) LED should turn from Amber to Blue; immediate and vigorous bass response should be heard and felt from the port tube opening.

Sweep Function

1) Follow steps 6-8 above, using a sweep generator as a signal source.
2) Sweep generator from 20Hz to 300Hz. Listen to the cabinet and drivers for any rattles, clicks, buzzes or any other noises. If any unusual noises are heard, remove woofers and test.

Driver Function

1) Remove woofer from cabinet; detach + and - wire clips.
2) Check DC resistance of woofer; it should be **3.0 ohms** ±10%
3) Connect a pair of speaker cables to driver terminals. Cables should be connected to an integrated amplifier fed by a signal generator. Turn on generator and adjust so that speaker level output is **5.0**V.
4) Sweep generator from 20Hz to 1kHz. Listen to driver for any rubbing, buzzing, or other unusual noises.

harman/kardon TECH TIPS

Troubleshooting tips and solutions to common service problems

For models: HKTS7 SUB (SUB-TS7) **TIP# HKTT2004-04**

Subject:

Improved filter performance

Instructions:

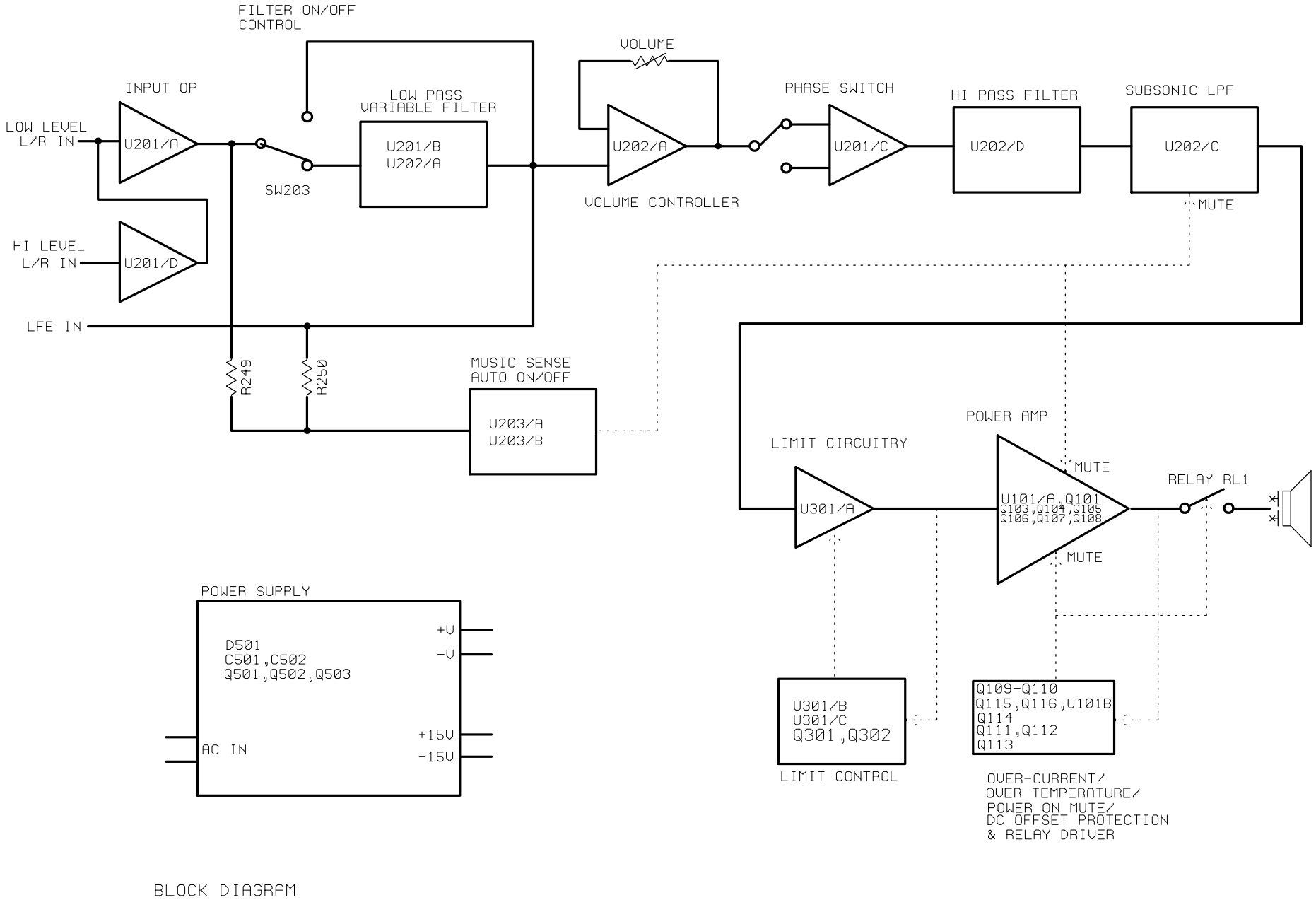
Change four 1/6W ±5% CF Resistors in the PREAMP PCB of the HKTS 7 subwoofer amplifier. It is recommended this procedure be followed for every unit that has to be serviced, for any reason.

Designator	Original value	New value	h/k part number
R223	51kΩ	30kΩ	110-16303J26
R224	51kΩ	30kΩ	
R226	27kΩ	10kΩ	110-16103j26
R227	27kΩ	12kΩ	110-16123j26

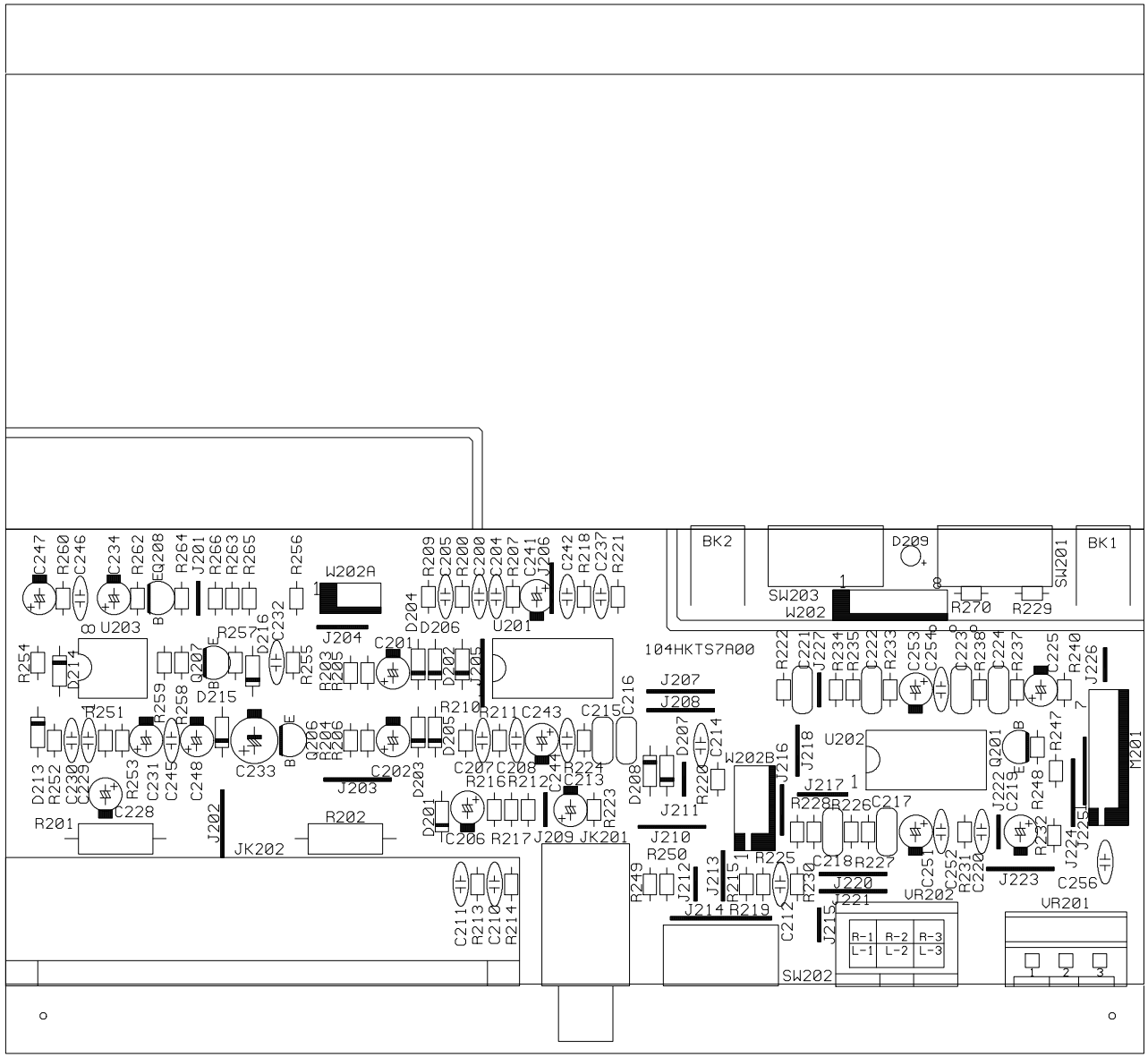
NOTE:

- Lack of this modification is unlikely to generate a complant
- It will have no effect in applications when the SUB input is used, or when the sub amp is used with the FILTER switch in the OFF position.

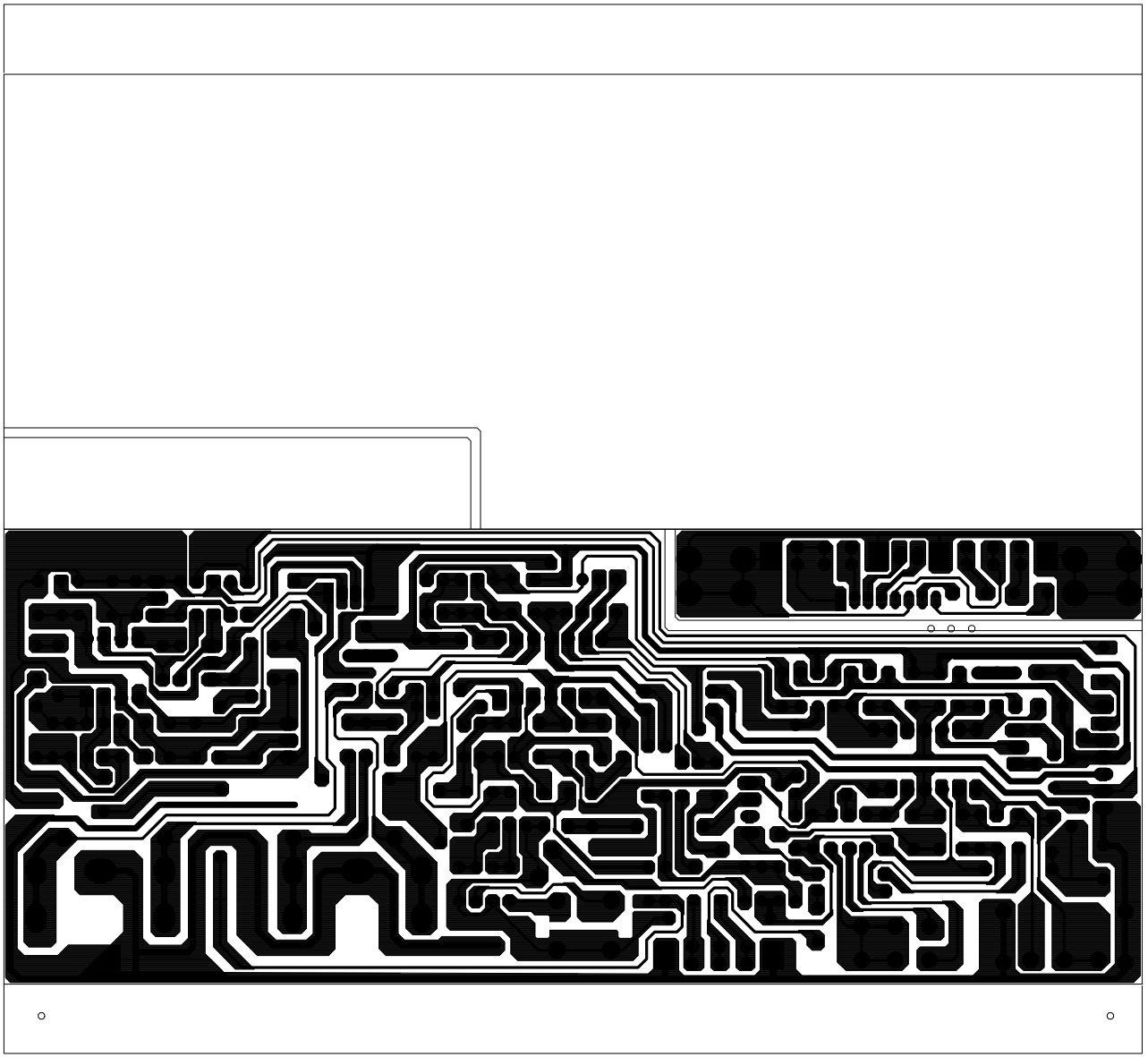
Model	Serial Number (120v)	Serial Number (230v)	Status	Action
SUB-TS7	ME048503390 and below	ME048708198 and below	In need of filter modification	Change value of R223,224,226,227
SUB-TS7	ME048503391 and above	ME048708199 and above	Modified by Factory	None Required



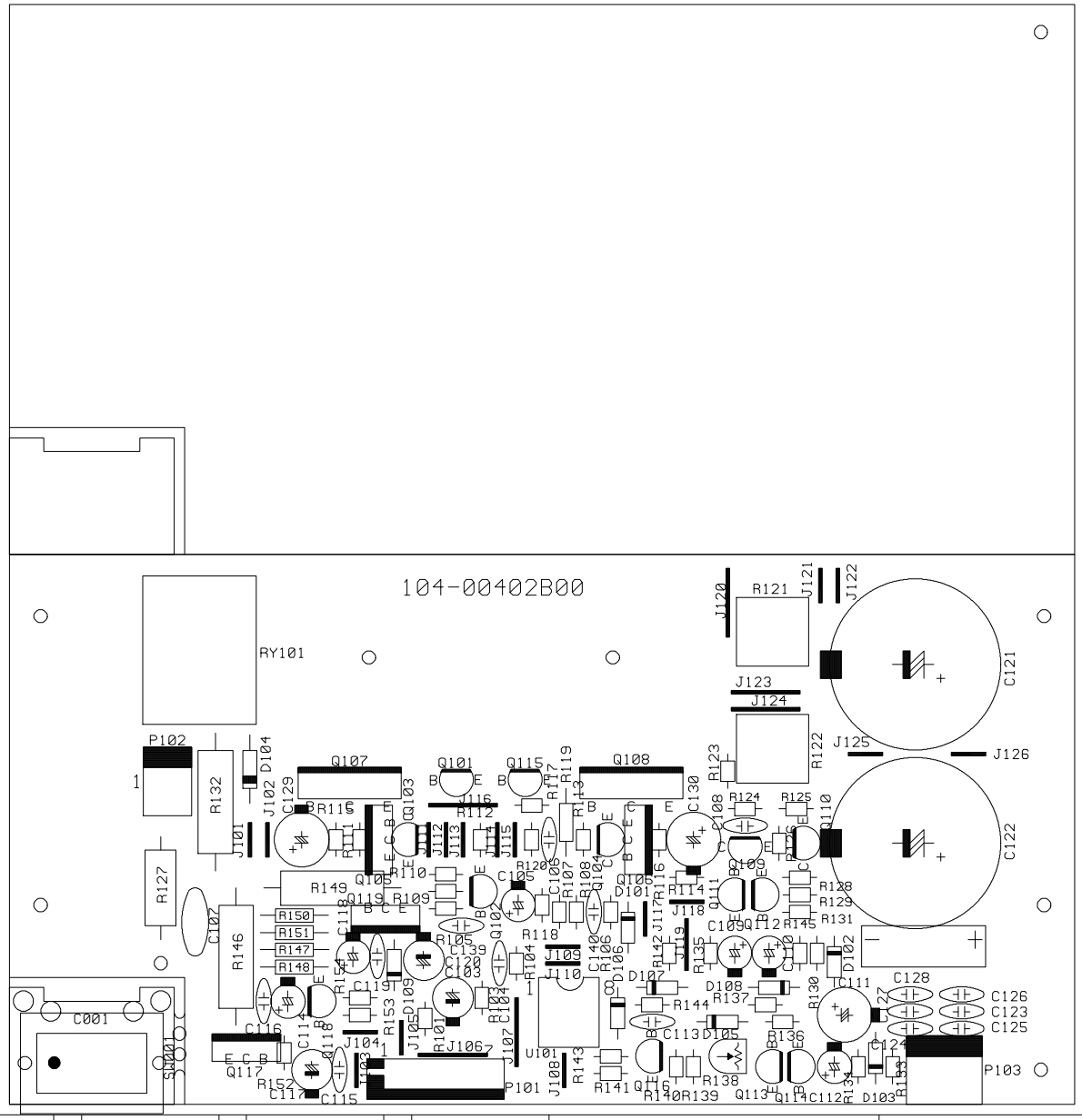
BLOCK DIAGRAM



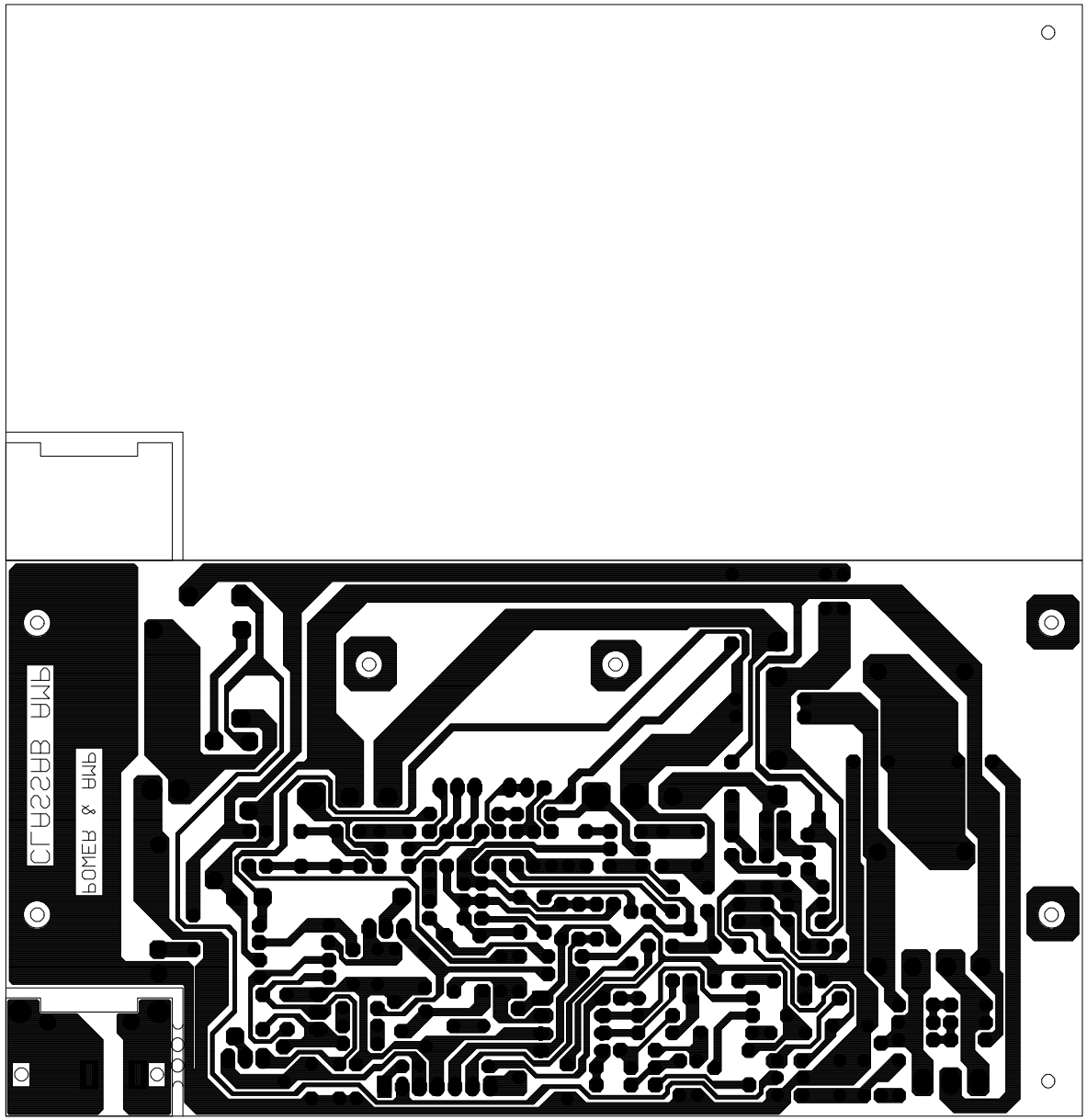
	DRAW.		DSGN.		APVD.		
FILENAME :HKTS7PRE.PCB						REVISION:	
MODEL NO. 104-HKTS7A00						1	
MATERIAL : FR-1(94V0)						2	
LAYER SILK SCREEN						3	



	DRAW.		DSGN.		APVD.		FILENAME :HKTS7PRE.PCB	REVISION:
							MODEL NO. 104-HKTS7A00	1
							MATERIAL : FR-1(94V0)	2
							LAYER SOLDER PATTERN	3



DRAW.	DSGN.	APVD.	FILENAME : HKTS7U.PCB	REVISION:
			MODEL NO. 104-00402B00	1
			MATERIAL : FR-1(94V0)	2
			LAYER SILK SCREEN	3



	DRAW.		DSGN.		APVD.		

FILENAME : HKTS7U.PCB	REVISION:	
MODEL NO. 104-00402B00	1	
MATERIAL : FR-1(94V0)	2	
LAYER SOLDER PATTERN	3	

SUB-TS7/TS8 120V Electrical parts list		
Part number	Description	Reference Designator
LIMITER PCB		
Resistors		
110-16103j26	Resistor 10K 1/6W ±5% CF 26mm	R301,R303,R304,R308,R309,R314,
110-16153j26	Resistor 15K 1/6W ±5% CF 26mm	R302,
110-16223j26	Resistor 22K 1/6W ±5% CF 26mm	R310,R312,
110-16333j26	Resistor 33K 1/6W ±5% CF 26mm	R305,
110-16474j26	Resistor 470K 1/6W ±5% CF 26mm	R307,
110-16751j26	Resistor 750Ω 1/6W ±5% CF 26mm	R311,R313,
110-16755j26	Resistor 7.5M 1/6W ±5% CF 26mm	R306,
Capacitors		
135-3226m50	Elec. Capacitor 22U 50V ±20%	C301,
135-3476m25	Elec. Capacitor 47U 25V ±20%	C304,
130-2f104z503	disk capacitor 0.1U 50V +80/-20%	C305,C306,
132-103j503	Mylar capacitor 0.01U 50V ±5%	C302,C303,
162-10059001	Single wire 50mm WHITE UL1007 AWG26	
Semiconductors		
190-16tl074cn	I.C TL074CN ST QUAD OP-AMP+B78	U301,
192-027c1815gr	Transistor 2SC1815GR NPN	Q301,Q302,
197-131n4148	Diode1N4148 26mm	D301,D302,
Miscellaneous		
162-50159002	7PIN 150mm AWG26 UL 2468	P302,
175-9f40hr2	connector 40PIN PITCH=2.54mm	
PREAMP PCB		
Resistors		
110-12472j52	Resistor4.7K 1/2W ±5% CF 52mm	R201,R202,
110-16102j26	Resistor 1K 1/6W ±5% CF 26mm	R213,R214,R215,R254,R209,R212,R216,R217,
110-16103j26	Resistor 10K 1/6W ±5% CF 26mm	R218,R220,R221,R222,R225,R228,R229,R230,
		R232,R235,R240,R248,R260,R270,
110-16104j26	Resistor 100K 1/6W ±5% CF 26mm	R231,R263,R266,
110-16105j26	Resistor 1M 1/6W ±5% CF 26mm	R259,
110-16122j26	Resistor 1.2K 1/6W ±5% CF 26mm	R265,
110-16124j26	Resistor 120K 1/6W ±5% CF 26mm	R233,
110-16151j26	Resistor 150Ω 1/6W ±5% CF 26mm	R253,
110-16154j26	Resistor 150K 1/6W ±5% CF 26mm	R252,
110-16183j26	Resistor 18K 1/6W ±5% CF 26mm	R262,
110-16203j26	Resistor 20K 1/6W ±5% CF 26mm	R237,R238,
110-16205j26	Resistor 2M 1/6W ±5% CF 26mm	R257,
110-16223j26	Resistor 22K 1/6W ±5% CF 26mm	R247,R255,R256,
110-16273j26	Resistor 27K 1/6W ±5% CF 26mm	R226,R227,
110-16472j26	Resistor 4.7K 1/6W ±5% CF 26mm	R200,R207,R258,
110-16473j26	Resistor 47K 1/6W ±5% CF 26mm	R219,R249,R250,R251,R264
110-16512j26	Resistor 5.1K 1/6W ±5% CF 26mm	R210,R211,
110-16513j26	Resistor 51K 1/6W ±5% CF 26mm	R223,R224,
110-16752j26	Resistor 7.5K 1/6W ±5% CF 26mm TA	R234,
110-16913j26	Resistor 91K 1/6W ±5% CF 26mm	R203,R204,R205,R206,
115-h503a102	Variable resistor RV16AE-20B2-15K-A54-104(A50K)	VR201
Capacitors		
129-a154j633	Mylar capacitor 0.15U 63V ±5% MSC	C221,C222,
129-a224j633	Mylar capacitor 0.22uF 63V ±5% MSC	C218
130-2b221k503	disk capacitor 220P 50V ±10%	C200,C204,C205,C207,C208,C210,C211,C212,
		C214,C220,C230,C237,
130-2b470k503	disk capacitor 47P 50V ±10%	C229,
130-2f104z503	disk capacitor 0.1U 50V +80/-20%	C232,C242,C244,C245,C246,C252,C254,C256,

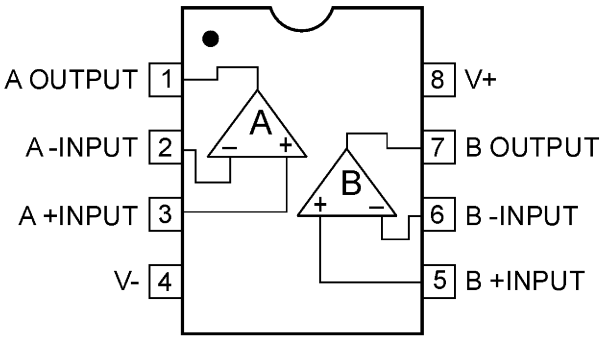
Part number	Description	Reference Designator
PREAMP PCB		
132-183j503	Mylar capacitor 0.018uF 50V ±5%	C223,
132-223ja03	Mylar capacitor 0.022uF 100V ±5%	C215,
132-473j503	Mylar capacitor 0.047U 50V ±5%	C224,
132-563j503	Mylar capacitor 0.056U 50V ±5%	C216,
132-823j503	Mylar capacitor 0.082U 50V ±5%	C217,
135-3105m50	elec. capacitor 1U 50V ±20%	C228,
135-3106m50	Elec. Capacitor 10uF 50V ±20%	C201,C202,C206,C213,C219,C231,C241,C243,
		C251,C253,
135-3107m16	Elec. Capacitor 100uF 16V ±20%	C234,
135-3226m50	Elec. Capacitor 22U 50V ±20%	C225,
135-3227m16	Elec. Capacitor 220U 16V ±20%	C233,
Semiconductors		
192-027c1815gr	Transistor 2SC1815GR NPN	Q201,Q206,Q207,Q208,
197-131n4148	Diode 1N4148 26mm	D201,D202,D203,D204,D205,D206,D207,D208,
		D214,D215,D216,
199-15000335	ZENER diode 3.3V 1/2W 52mm	D213,
162-50332003	2PIN 330mm RED/GREEN LED	D209,
190-06m4558d	I.C. OPA 4558D Dual Op-Amp	U203,
190-16tl074cn	I.C TL074CN ST Quad Op-Amp	U201,U202,
Miscellaneous		
162-a016d001	wire assembly UL1007 160/80mm#26	
174-0rca313v	RCA JACK RCA-313G V/R/W	JK201,
174-20810360g	SPK JK BP 8PIN	JK202,
175-1b08v01	connector 8 PIN PITCH=2.0mm	
180-tms7210v	SWITCH SLIDE 6PIN MS7210V	SW201,SW202,SW203,
362-FE-00041	PCB bracket 11.75*8.5*12.5H	
MAIN PCB		
Resistors		
110-14472j26	Resistor 4.7K 1/4W ±5% CF 26mm	R147,R150,
110-14681j26	Resistor 680Ω 1/4W ±5% CF 26mm	R148,R151,
110-16101j26	Resistor 100Ω 1/6W ±5% CF 26mm	R120,
110-16102j26	Resistor 1K 1/6W ±5% CF 26mm	R124,
110-16103j26	Resistor 10K 1/6W ±5% CF 26mm	R134,
110-16105j26	Resistor 1M 1/6W ±5% CF 26mm	R143,
110-16123j26	Resistor 12K 1/6W ±5% CF 26mm	R135,R139,
110-16152j26	Resistor 1.5K 1/6W ±5% CF 26mm	R103,R123,R136,R137,R141,R142,
110-16153j26	Resistor 15K 1/6W ±5% CF 26mm	R118,R145,R152,R154,
110-16154j26	Resistor 150K 1/6W ±5% CF 26mm	R131,
110-16181j26	Resistor 180Ω 1/6W ±5% CF 26mm	R111,R114
110-16182j26	Resistor 1.8K 1/6W ±5% CF 26mm	R153,
110-16223j26	Resistor 22K 1/6W ±5% CF 26mm	R128,R129,R133,
110-16332j26	Resistor 3.3K 1/6W ±5% CF 26mm	R106,R107,R144
110-16392j26	Resistor 3.9K 1/6W ±5% CF 26mm	R105,R108,
110-16393j26	Resistor 39K 1/6W ±5% CF 26mm	R126,
110-16470j26	Resistor 47Ω 1/6W ±5% CF 26mm	R112,R113,R115,R116,
110-16471j26	Resistor 470Ω 1/6W ±5% CF 26mm	R140,
110-16472j26	Resistor 4.7K 1/6W ±5% CF 26mm	R110,R125,R130,
110-16473j26	Resistor 47K 1/6W ±5% CF 26mm	R101,
110-16560j26	Resistor 56Ω 1/6W ±5% CF 26mm	R117,
110-16563j26	Resistor 56K 1/6W ±5% CF 26mm	R104,
110-16682j26	Resistor 6.8K 1/6W ±5% CF 26mm	R109,
110-10821jk2	Resistor 820Ω 1W ±5%	R132,
110-122r2j15	Resistor 2.2Ω 1/2W ±5%	R127,
110-20331jk2	Resistor 330Ω 2W ±5% 5mm	R146,R149,
113-50r10j10	Cermemt resistor 0.1Ω 5W ±5%	R121,R122,
114-03302m0	Variable resistor 3K 0.3W ±20%	R138,

Part number	Description	Reference Designator
MAIN PCB		
Semiconductors		
192-027c1815gr	Transistor 2SC1815GR NPN	Q102,Q111,Q112,Q113,Q118
192-028a1015gr	Transistor 2SA1015GR PNP	Q114,Q116,
192-1672n5551	Transistor 2N5551 NPN	Q103,Q109,
192-1682n5401	Transistor 2N5401 AI-PNP 350V	Q104,Q110,
197-131n4148	Diode 1N4148 26mm	D101,D103,D105,D108,
199-15000335	ZENER diode 3.3V 1/2W 52mm	D102,
199-15000625	ZENER diode 6.2V 1/2W 52mm	D106,D107,
199-15001605	ZENER diode 16V 1/2W 52mm	D109,
192-021c1815gr	Transistor 2SC1815GR NPN	Q101,Q115,
192-021tip35c	Transistor TIP35C NPN	Q107,
192-022tip36c	Transistor TIP36C PNP	Q108,
192-201d882y	Transistor KSD882Y NPN	Q117,
192-202b772y	Transistor KSB772Y PNP	Q119,
192-991d669a	TransistorHI-SINCERITY HSD669A NPN	Q106,
192-992b649t	Transistor HSB649T PNP	Q105,
197-00kbl405	bridge diode 4A 500V KBL405	D110,
197-101n4002	Diode 1N4002	D104,
190-06m4558d	I.C. OPA 4558D Dual Op-Amp	U101,
Capacitors		
130-2b102k503	disk capacitor 1000P 50V ±10%	C116,
130-2f104z503	disk capacitor 0.1U 50V +80/-20%	C108,C113,C115,C119,
130-3f473m503	disk capacitor 0.047U 50V ±20%	C106,
130-sl101k503	disk capacitor 100P 50V SL ±10%	C139,C140,
132-104j503	Mylar capacitor 0.1U 50V ±5%	C107,
132-223ja03	Mylar capacitor 0.022uF 100V ±5%	C124,C125,C126,C128,
135-3105m50	elec. Capacitor 1U 50V ±20%	C105,C112,
135-3107m16	Elec. Capacitor 100uF 16V ±20%	C109,C117,C120,
135-3226m50	Elec. Capacitor 22U 50V ±20%	C114,C118,
135-3227m10	Elec. Capacitor 220U 10V ±20%	C129,C130,
135-3227m16	Elec. Capacitor 220U 16V ±20%	C111,
135-3476m25	Elec. Capacitor 47U 25V ±20%	C103,
130-3f472md00	disk capacitor 4700P 400V ± 20%	for Power Switch
132-223ja03	Mylar capacitor 0.022uF 100V ±5%	C123,C127,
135-3107m16	Elec. Capacitor 100uF 16V ±20%	C110,
135-4688m50	Elec. Capacitor 6800U/50V ±20%	C121,C122,
Miscellaneous		
171-udhss124d	relay 5A 24V UDH-SS124D	RY101,
175-1c07v01	connector 7PIN PITCH=2.5mm	P101,
175-1d02v01	connector 2PIN PITCH=3.96mm	P102,
175-1d03v01	connector 3 PIN PITCH=3.96mm	P103,
193-3m2520	Insulator TO-3P 25x20mm	for Q107,Q108,
MISCELLANEOUS/MECHANICAL		
323-AL-00020	HEAT SINK 65*32*31	
351-AM03014A094	SCREW M3*14 BLK	
352-AM03008D040	SCREW □3*8 B type	
361-FE-00051	Transistor holder 14.2*8.0*5.2	
361-NYL-00054	Transistor Insulator (SW06002)	
150-e8604107	Power Transformer EI-86 60Hz 120V TT0869906580	
152-u602015	AC Line cord SVT FT-2	
154-u25006t0	fuse 2.5A 250V 20mm	
155-520020	fuse holder R3-11	
162-10082007	WIRE RED 18AWG 80mm	
162-a040d001	Speaker cable #1015 400mm 991110-00	
176-wjce1	terminal CE-1	
180-pbr12c11s	Power switch PUSH BR12C11S	
302-AL-00435-0BA	Alum. Back panel 270*215*2.5T HKTS7	
	Alum. Back panel 270*215*2.5T HKTS8	

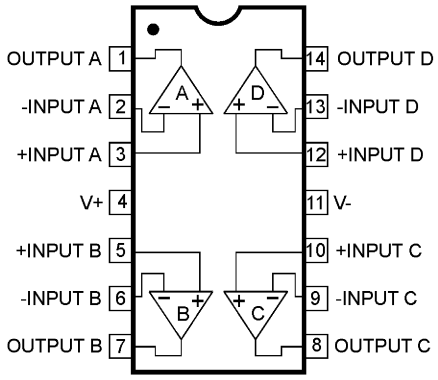
Part number	Description	Reference Designator
MISCELLANEOUS/MECHANICAL		
306-ABS-00004	REAR CABINET 268*213*102 A.B.S UL	
311-ABS-00028	knob 46077-W P.V.C.	
320-RUB-00033	Rubber pad 25*21*4t	R-4
323-AL-00019	HEAT SINK 117.5*60*25	
333-EVA-00096	EVA (Gasket) 213*15*2.0mm	
333-EVA-00097	EVA (Gasket) 213*15*1.0t	
333-EVA-00132	EVA (Gasket) 238*15*2.0mm	
333-EVA-00133	EVA (Gasket) 238*15*1.0t	
333-EVA-00188	EVA (Gasket) 170x5x1t	
333-EVA-00220	EVA (Gasket) 225*15*1t UL	
335-NYL-00002	bushing 4K-4 NO-BB	
350-EM04012D024	SCREW 4□*12 BLK	R/C-4
351-AM03008A079	SCREW M3*8 BLK	BRKT-2,PCB TO BRKT-4
351-HM04016A218	SCREW M4*16	R-4
352-AM03010D063	SCREW □3*10 B type	R/P-6,R/P TO H/S-2
352-AM03010D065	SCREW □3*10 P type	-2,RCA JK-1
354-GM04002	M4 NUT BLK	R-4
362-FE-00013	PCB bracket L TYPE t=1.6mm	

Integrated Circuit Diagrams

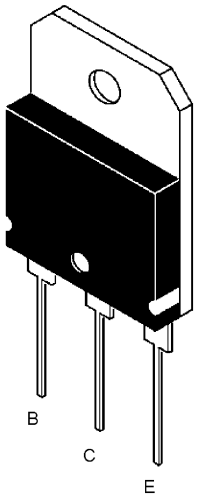
4558 Dual Op Amp
U101,203



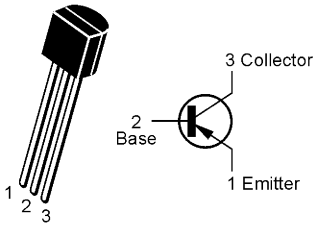
OPAMP, QUAD 14P DIL TL074
U201, 202, 301



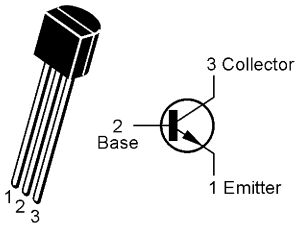
TIP35C, TIP36C
Q107,108



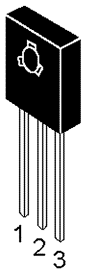
2N5401
Q104, 110



2N5551
Q103, 109

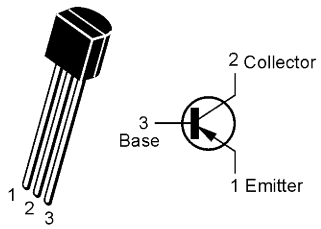


HSD669,HSB649,
KSD772Y,KSD8827
Q106,109,117,119

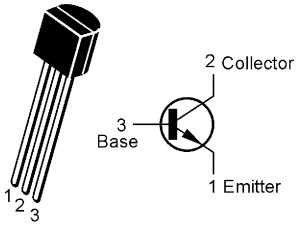


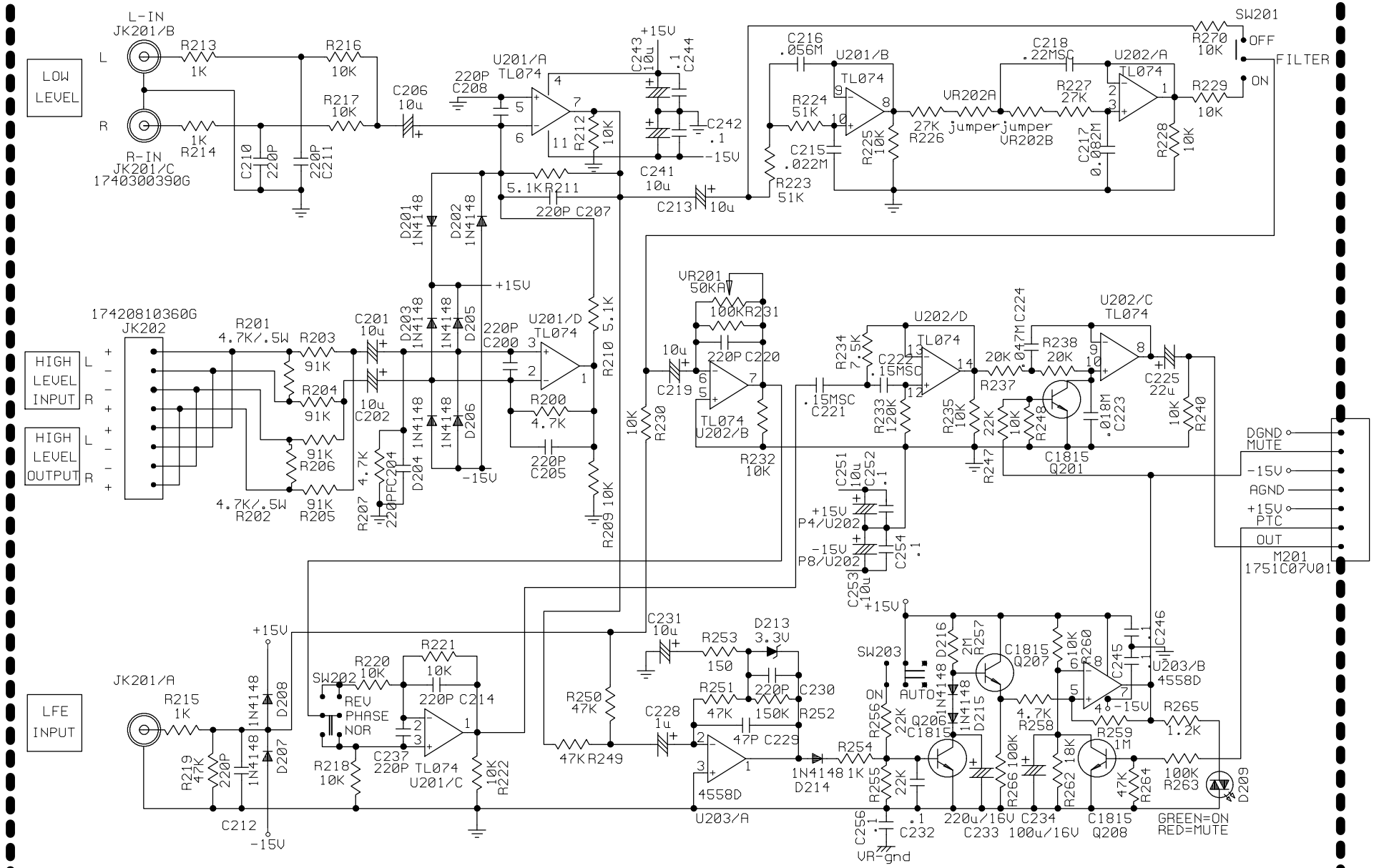
1. Emitter
2. Collector
3. Base

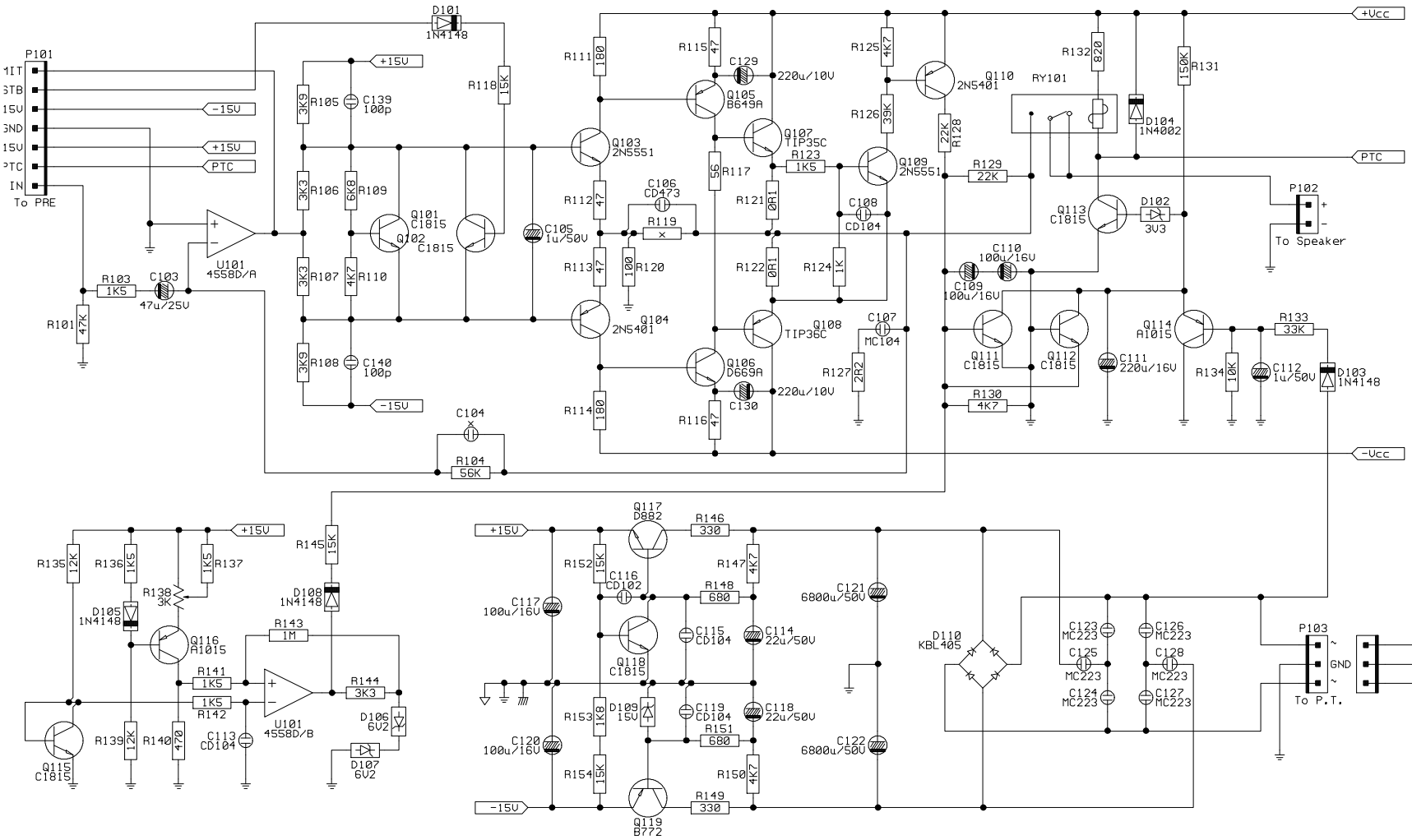
2SA1015
Q114,116 ,105

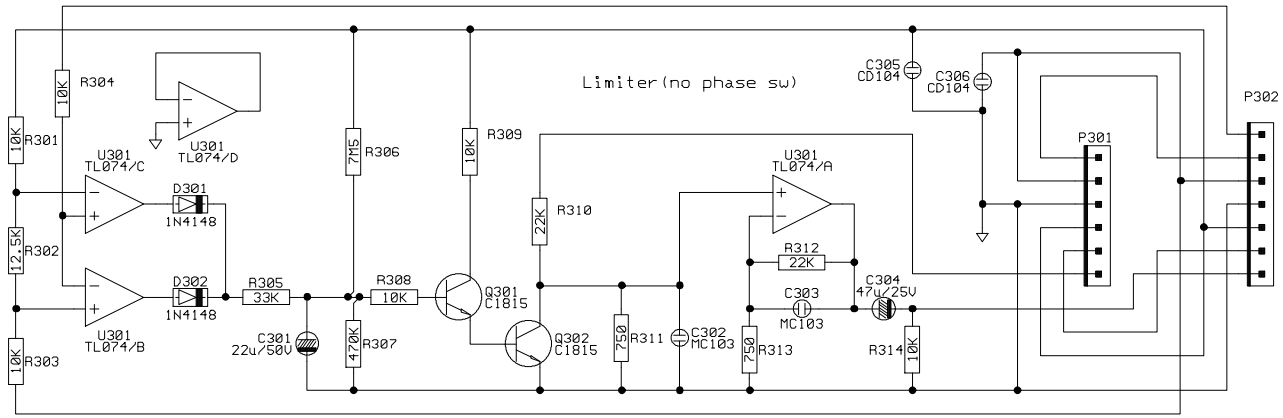


2SC1815
Q101,102,111,112,113,115,118,201,
206,207,208, 301,302.



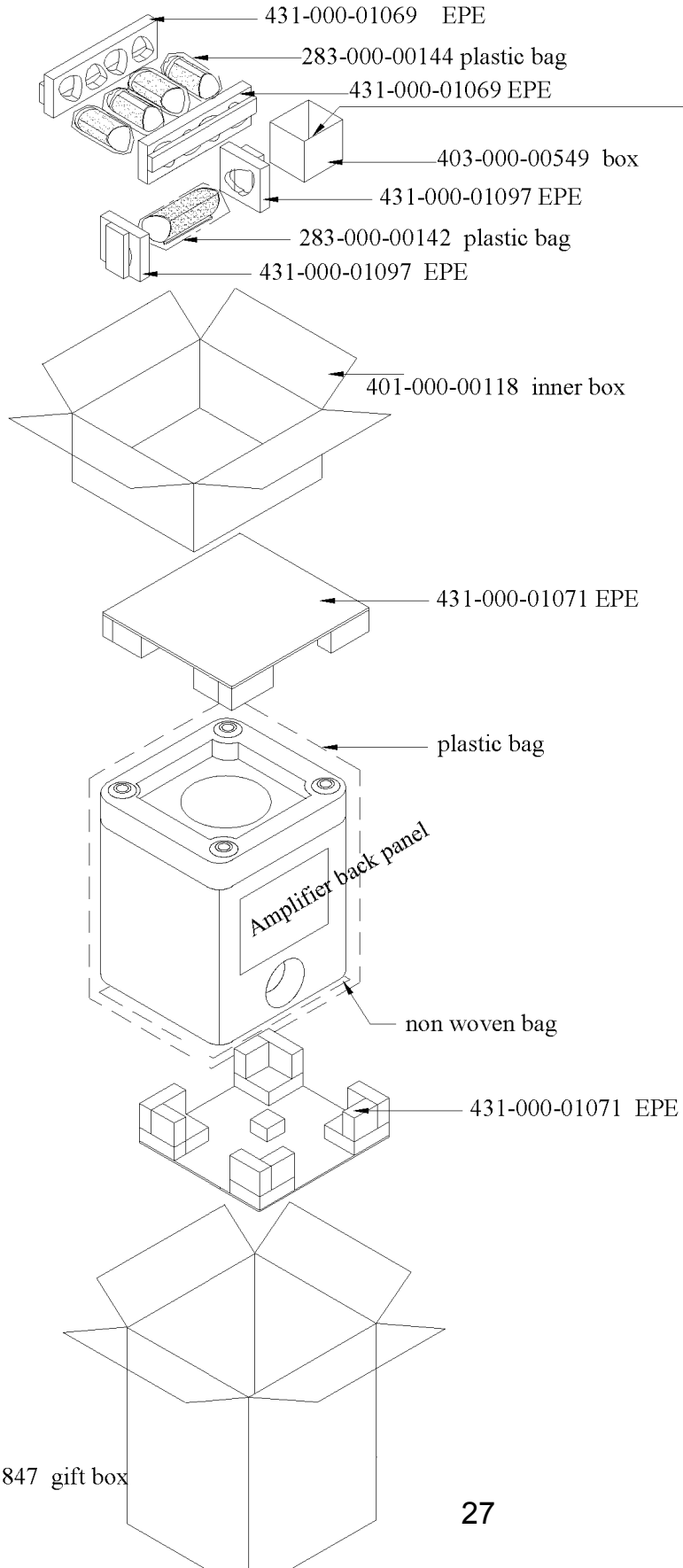

LOW LEVEL
L-IN JK201/B
R-IN JK201/C 17403000390G
R213 1K
R214 1K
R216 10K
R217 10K
C206 10u
C208 220P
U201/A TL074
R212 10K
C210 220P
C211 220P
C243 10u
C244 .1
C242 .1
C241 10u
C213 10u
5.1K R211
220P C207
D201 1N4148
D202 1N4148
+15V
-15V
C216 .056M
U201/B TL074
R224 51K
C215 .022M
R223 51K
R225 10K
VR202A 27K
R226 jumperjumper VR202B
C218 .22MSC
R227 27K
C217 0.082M
U202/A TL074
R229 10K
R228 10K
SW201
R270 10K
OFF
FILTER
ON
HIGH LEVEL INPUT
HIGH LEVEL OUTPUT
174208103600G JK202
R201 4.7K/.5W
R202 4.7K/.5W
R203 91K
R204 91K
R205 91K
R206 91K
C201 10u
C202 10u
C203 1N4148
C204 4.7K
220PFC204
D204 1N4148
D205 1N4148
D206 1N4148
220P C200
U201/D TL074
R200 4.7K
220P C205
R210 5.1K
R209 10K
VR201 50KA
100KR231
10K R230
10u C219
220P C220
TL074 U202/B
R232 10K
U202/D TL074
R234 7.5K
C222 .15MSC
C221 .15MSC
R233 120K
R235 10K
R237 20K
C224 .047M
R238 20K
U202/C TL074
C225 22
R240 10K
R248 10K
C223 .018M
C1815 Q201
R247 22K
C251 10u
C252 .1
C253 10u
C254 .1
P4/U202
P8/U202
DGND
MUTE
-15V
AGND
+15V
PTC
OUT
M201 1751C07V01
LFE INPUT
JK201/A
R215 1K
D208 1N4148
D207 1N4148
R219 47K
220P
R220 10K
SW202
REV
PHASE
NOR
R221 10K
220P C214
C237 220P
TL074 U201/C
R218 10K
R222 10K
C212
R250 47K
47KR249
C231 10u
R253 150
D213 3.3V
R251 47K
220P C230
150K R252
C228 1u
47P C229
4558D U203/A
1N4148 D214
R254 1K
SW203
ON
AUTO
R256 22K
R255 22K
D216 1N4148
D215 1N4148
2M R257
C1815 Q207
C1815 Q206
R260 10K
C245 .1
C246 .1
U203/B 4558D
4.7K R258
R259 1M
R265 1.2K
R266 100K
R262 18K
C1815 Q208
47K R264
100K R263
D209
GREEN=ON
RED=MUTE
C256 .1
C232 .1
C233 100u/16V
220u/16V C234
VR-gnd
HKTS
JACK PANEL PCB
DRAW.
DSGN.
APVD.
FILENAME : HKTS7U.SCH
REVISION :
MODEL NO.010-0N10-00402
DWN BY : C.S.WANG
DATE : 2003-10-14


P101
MIT
GTB
15V
GND
15V
PTC
IN
To PRE
D101
1N4148
+15V
-15V
+15V
PTC
R118 15K
R105 3K9
C139 100p
R106 3K3
R109 6K8
R107 3K3
R110 4K7
R108 3K9
C140 100p
-15V
Q101 C1815
Q102 C1815
U101 4558D/A
R103 1K5
C103 47u/25V
R101 47K
C104
R104 56K
C105 1u/50V
R111 180
R112 47
R113 47
R120 100
R114 180
Q103 2N5551
Q104 2N5401
C106 CD473
R119 x
R115 47
C129
220u/10V
Q105 B649A
Q107 TIP35C
R123 1K5
R117 56
R121 0R1
R122 0R1
R124 1K
Q108 TIP36C
C107 MC104
R127 2R2
R116 47
C130
220u/10V
Q106 D669A
C108 CD104
Q109 2N5551
R125 4K7
R126 39K
R128 22K
Q110 2N5401
R129 22K
R130 4K7
RY101
R132 820
R131 150K
D104 1N4002
+Vcc
PTC
-Vcc
P102
To Speaker
Q113 C1815
D102 3V3
C110 100u/16V
C109 100u/16V
Q111 C1815
Q112 C1815
C111 220u/16V
Q114 A1015
R133 33K
R134 10K
C112 1u/50V
D103 1N4148
AC120V/60Hz
T1
SW100
472/400V
FUSE
T2.5AL/250V
P103
GND
To P.T.
D110 KBL405
C123 MC223
C125 MC223
C124 MC223
C126 MC223
C128 MC223
C127 MC223
C121 6800u/50V
C122 6800u/50V
+15V
-15V
Q117 D882
Q118 C1815
Q119 B772
R146 330
R147 4K7
R148 680
R151 680
R149 330
R150 4K7
R152 15K
R153 1K8
R154 15K
C116 CD102
C115 CD104
C114 22u/50V
C119 CD104
C118 22u/50V
C117 100u/16V
C120 100u/16V
D109 15V
R135 12K
R136 1K5
R137 1K5
R138 3K
D105 1N4148
Q116 A1015
R143 1M
R145 15K
D108 1N4148
R141 1K5
R142 1K5
R144 3K3
U101 4558D/B
D106 6V2
D107 6V2
Q115 C1815
R139 12K
R140 470
C113 CD104


Limiter(no phase sw)
R304 10K
U301 TL074/D
R301 10K
U301 TL074/C
D301 1N4148
R302 12.5K
D302 1N4148
U301 TL074/B
R303 10K
R305 33K
C301 22u/50V
R306 7M5
R307 470K
R308 10K
Q301 C1815
Q302 C1815
R309 10K
R310 22K
R311 750
C302 MC103
R313 750
U301 TL074/A
R312 22K
C303 MC103
C304 47u/25V
R314 10K
C305 CD104
C306 CD104
P301
P302

Package drawing

HKTS7



326-ABS-00108 Mounting bracket
326-FE-00109 Metal plate
317-PS-00172 Terminal cover
370-000-00257 green cable
370-000-00261 white cable
370-000-00256 red cable
370-000-00264 grey cable
370-000-00265 blue cable
370-000-00092 purple RCA cable
371-000-00360 screw package

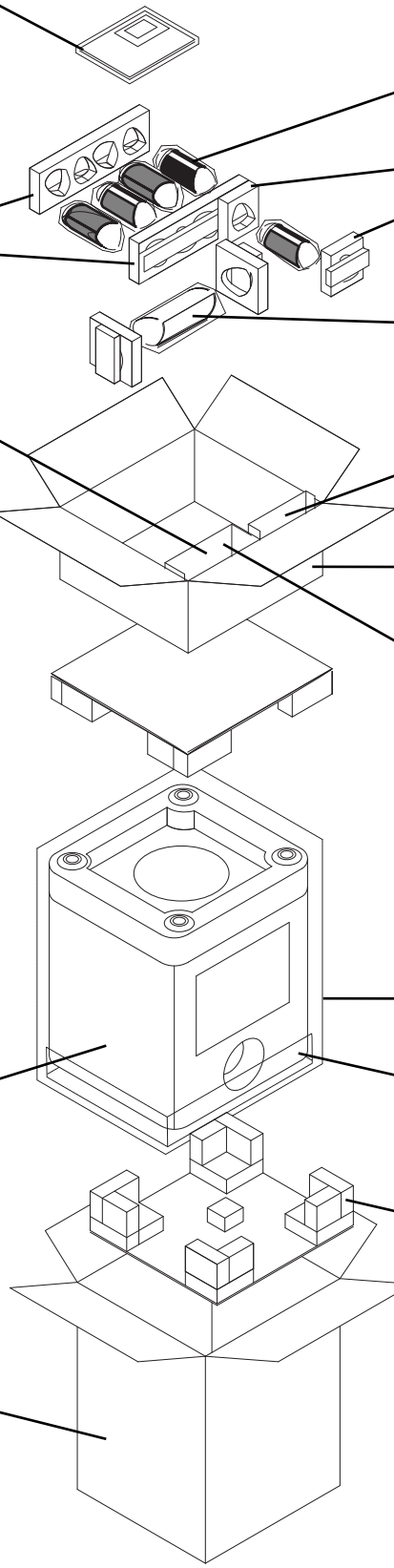
(in a bag in inner box)

398-PAP-00319 color code
405-000-00333 warranty card
406-000-00980 owners manual

HKTS 8

harman/kardon®

Packaging



OWNER'S MANUAL
406-000-05108

WARRANTY CARD
405-000-00333

COLOR CODE
413-000-05097

FOAM PACKING
431-00005154

WIRES:
GREEN 20FT CENTER
370-000-05002

WHITE 20FT FRONT SATS
370-000-00092

RED 20FT
370-000-00265

GREY 40FT REAR SATS
370-000-00264

BLUE 40FT REAR SATS
370-000-00256

PURPLE RCA SUB CABLE
370-000-00261

BROWN 40FT REAR SATS
370-000-00257

HKTS 8
SUBWOOFER
(SUB TS8)

OUTER CARTON
402-000-05185

SATELLITES (5)
HKTS 8 SAT-1

FOAM PACKING
431-00005153

CENTER CHANNEL
HKTS 8 CEN-1

MOUNTING BRACKETS (5)
326-ABS-00108

SAT/CENTER CARTON
401-000-05023

SCREW PACKAGE (1 SET)
371-000-05048

MOUTING PLATES (5)
326-FE-00109

TERMINAL COVER (5)
317-PS-00172

PLASTIC BAG

CLOTH

PACKING
431-000-05037